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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/830,849	07/31/2001	Takuji Nomura	207188US2PCT	3557

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EXAMINER	
GIESY, ADAM	

ART UNIT	PAPER NUMBER
2651	

DATE MAILED: 03/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/830,849	NOMURA ET AL.	
	Examiner	Art Unit	
	Adam R. Giesy	2651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *7/31/2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *11-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11-13 and 16-28* is/are rejected.

7)☒ Claim(s) *14 and 15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *7/31/2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-10 have been cancelled without prejudice as requested in the preliminary amendment filed on May 2, 2001.

Specification

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally **limited to a single paragraph** on a separate sheet within the range of **50 to 150 words**. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 11-13 and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanabe et al. (Tanabe – JP Doc. No. 10188332 A, see the electronic translation) in view of Wada et al. (Wada – US Doc. No. 2004/0264347).

Regarding claim 11, Tanabe discloses a light source (Drawing 1, element 1), an objective lens (read as condenser lens – 5) for converging outgoing light from the light source on an optical recording medium (6), a phase correcting element (read as liquid crystal lens – 4) is

provided between the light source (1) and the objective lens (5) to change a wave front of the outgoing light, the phase correcting element including an anisotropic optical medium (liquid crystal – paragraph 0043) sandwiched between a pair of substrates (paragraph 0017; drawing 2, elements 11 and 12), at least one of the substrates being transparent (paragraph 0017), the paired substrates having surfaces provided with electrodes (14 and 15) for voltage application to the anisotropic optical medium. Tanabe does not disclose that the electrode on at least one of the substrates has a plurality of power supply electrodes provided thereon at different positions, thereby providing different voltages to the plural power supply electrodes; nor does he disclose a control voltage generator for outputting a voltage for changing the wave front to the phase correcting element.

Wada discloses an optical element (Figure 1, element 10) that comprises liquid crystal lens (15) with two substrates (11 and 12) and two electrodes (13 and 17), wherein the electrode on at least one of the substrates (13) has a plurality of power supply electrodes provided thereon at different positions (13a-13g), thereby providing different voltages to the plural power supply electrodes (see paragraph 0069). Wada also discloses the use of a control voltage generator (read on by drive circuit – Figure 9, element 57) for outputting a voltage for changing the wave front to the phase correcting element (see paragraph 0130). Combining the disclosures of Tanabe and Wada would yield an optical head device with a light source, converging lens, phase correcting element, and a control voltage generator.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the disclosures by Tanabe and Wada, the motivation being to produce an

optical recording head that has self contained phase correction for use in recording data onto optical media.

Regarding claim 12, Tanabe discloses a light source (Drawing 1, element 1), an objective lens (read as condenser lens – 5) for converging outgoing light from the light source on an optical recording medium (6), a phase correcting element (read as liquid crystal lens – 4) is provided between the light source (1) and the objective lens (5) to change a wave front of the outgoing light, the phase correcting element including an anisotropic optical medium (liquid crystal – paragraph 0043) sandwiched between a pair of substrates (paragraph 0017; drawing 2, elements 11 and 12), at least one of the substrates being transparent (paragraph 0017), the paired substrates having surfaces provided with electrodes (14 and 15) for voltage application to the anisotropic optical medium. Tanabe does not disclose that the electrode on at least one of the substrates has a plurality of power supply electrodes provided thereon at different positions, not less than two of the plural power supply electrodes being conductively connected together through a thin film resistor comprising a conductive thin film. Also, Tanabe does not disclose a control voltage generator for outputting a voltage for changing the wave front to the phase correcting element. Wada discloses an optical element (Figure 1, element 10) that comprises liquid crystal lens (15) with two substrates (11 and 12) and two electrodes (13 and 17), wherein the electrode on at least one of the substrates (13) has a plurality of power supply electrodes provided thereon at different positions (13a-13g), not less than two of the plural power supply electrodes being conductively connected together through a thin film resistor comprising a conductive thin film (see paragraphs 0088 and 0089).

Wada also discloses the use of a control voltage generator (read on by drive circuit – Figure 9, element 57) for outputting a voltage for changing the wave front to the phase correcting element (see paragraph 0130). Combining the disclosures of Tanabe and Wada would yield an optical head device with a light source, converging lens, phase correcting element, and a control voltage generator.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the disclosures by Tanabe and Wada, the motivation being to produce an optical recording head that has self contained phase correction for use in recording data onto optical media.

Regarding claim 13, the combination of Tanabe and Wada disclose all of the limitations of claim 12 as recited in the claim 12 rejection above. Further, Wada discloses an electrode (Figure 1, element 13) with the power supply electrodes provided thereon is divided into a plurality of divided electrodes (13a-13g), the respective divided electrodes have more than one power supply electrode provided thereon (see paragraph 0069), and not less than two of the power supply electrodes are conductively connected together through the thin film resistor (see paragraphs 0088 and 0089).

Regarding claims 16 and 17, the combination of Tanabe and Wada disclose all of the limitations of claims 11 and 12 as recited in the claim 11 and 12 rejections above. Further, Tanabe discloses that the substrate (12) has a curvature to it that allows it to serve as a convex lens (see paragraph 0035). Tanabe also discloses that a rubbing film of polyimide was applied to the top of the opposite substrate (11) and that an antireflective film was formed on the external

surfaces of both substrates (see paragraphs 0052 and 0053), thus making one of the substrates (11) non-translucent from the top.

Regarding claims 18 and 19, the combination of Tanabe and Wada disclose all of the limitations of claims 11 and 12 as recited in the claim 11 and 12 rejections above. Further, Tanabe discloses that the anisotropic optical medium is a liquid crystal (see paragraph 0043).

5. Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanabe et al. (Tanabe – JP Doc. No. 10188332 A) in view of Wada et al. (Wada – US Doc. No. 2004/0264347) and further in view of Tokunaga et al. (Tokunaga – US Pat. NO. 5,905,558).

Regarding claims 20 and 21, the combination of Tanabe and Wada disclose all of the limitations of claims 11 and 12 as recited in the claim 11 and 12 rejections above. Neither Tanabe nor Wada disclose that the electrodes have a resistance of not less than 100 ohm/square.

Tokunaga discloses that the electrodes in his LCD device have a resistance of 100 ohms or higher (column 9, lines 41-50).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the disclosures of Tanabe, Wada and Tokunaga, the motivation being to create an electrode for an LCD device of an optical head with improved laser resolution for data recording.

Regarding claim 22, the combination of Tanabe and Wada disclose all of the limitations of claim 12 as recited in the claim 12 rejection above. Neither Tanabe nor Wada disclose that all thin film resistors have a value of resistance in a range from 100 ohms to 1000 k ohms.

Tokunaga suggests that the electrodes of the LCD should have a resistance of 100 ohms or greater (column 9, lines 48-50).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to design the electrode resistances to be 100 ohms or greater, the motivation being in order to implement the LCD device.

6. Claims 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanabe et al. (Tanabe – JP Doc. No. 10188332 A) in view of Wada et al. (Wada – US Doc. No. 2004/0264347) and further in view of Slobodin (US Pat. No. 5,084,777) or Jacobson et al. (Jacobson – US Pat. No. 4,127,322).

The combination of Tanabe and Wada disclose all of the limitations of claims 11 and 12 as recited in the claim 11 and 12 rejections above. Neither Tanabe nor Wada disclose that each electrode material forming the electrodes has a sheet resistance of not less than 1000 times a sheet resistance of a power supply electrode material forming the power supply electrodes.

Slobodin suggests that the sheet resistance of the electrode should be greater than 10^{10} ohms/square in order to achieve a high resolution (column 2, lines 60-64). Jacobson suggests that the sheet resistance of the electrodes are 1000 ohms (column 7, lines 52-53). The sheet resistance values that are suggested by Slobodin and Jacobson would be 1000 higher than a power supply electrode which would be inherently low.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the suggestions of Slobodin or Jacobson regarding the sheet resistance values of the electrodes with the disclosure of the LCD device by Tanabe and Wada, the motivation being in order to increase power efficiency.

7. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanabe et al. (Tanabe – JP Doc. No. 10188332 A) in view of Wada et al. (Wada – US Doc. No.

2004/0264347) and further in view of Tokunaga et al. (Tokunaga – US Pat. No. 5,905,558) and even further in view of Hayashi et al. (Hayashi – JP Doc No. H08-074033 A).

The combination of Tanabe, Wada, and Tokunaga disclose all of the limitations of claims 20 and 21 as recited in the claim 20 and 21 rejections above. However, Tanabe, Wada, and Tokunaga do not disclose that the electrode material comprises one of a zinc oxide layer with gallium added thereto and a zinc oxide layer with gallium and silicon added thereto.

Hayashi discloses an electrode for a liquid crystal device in which a zinc oxide film with a gallium coating is used as a transparent conductive film (see abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the disclosures of Tanabe, Wada, Tokunaga, and Hayashi, the motivation being to provide the optimal resistance for the thin film electrodes of the liquid crystal device.

8. Claims 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanabe et al. (Tanabe – JP Doc. No. 10188332 A) in view of Wada et al. (Wada – US Doc. No. 2004/0264347) and further in view of Slobodin (US Pat. No. 5,084,777) or Jacobson et al. (Jacobson – US Pat. No. 4,127,322) and even further in view of Hayashi et al. (Hayashi – JP Doc No. H08-074033 A).

The combination of Tanabe, Wada, and Slobodin or Jacobson et al. disclose all of the limitations of claims 23 and 24 as recited in the claim 23 and 24 rejections above. Tanabe, Wada, and Jacobson or Slobodin do not disclose that the electrode material comprises on of a zinc oxide layer with gallium added thereto and a zinc oxide layer with gallium and silicon added thereto.

Hayashi discloses that a transparent conductive film (electrode) is comprised of a zinc oxide layer with gallium (see abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to produce the electrode, to be used in the optical device disclosed by Tanabe, Wada, and Jacobson or Slobodin, using a zinc oxide with gallium material as disclosed by Hayashi, the motivation being to create a clear electrode with a certain sheet resistance to implement the LCD device.

Allowable Subject Matter

9. Claims 14 and 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 14 is allowable over prior art of record which does not disclose or suggest all of the limitations of claim 11, as well as the further limitation that **the plural power supply electrodes are annular members and are concentrically provided each other, a first of the annular members has a radius ratio of 0.65 - 0.85 to luminous flux of the outgoing light starting from the light source and passing through the phase correcting element, and a second of the annular members has a radius ratio of 0.2 - 0.4 to the luminous flux.**

Claim 15 is allowable over prior art of record which does not disclose or suggest all of the limitations of claim 12, as well as the further limitation that **the plural power supply electrodes are annular members and are concentrically provided each other, a first of the annular members has a radius ratio of 0.65 - 0.85 to luminous flux of the outgoing light**

starting from the light source and passing through the phase correcting element, and a second of the annular members has a radius ratio of 0.2 - 0.4 to the luminous flux.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Ogasawara, Masakazu (US Doc. No. 2002/0105890 A1) disclose the use of an aberration correction device and phase changes for an optical write head.

b. Komma et al. (US Pat. No. 5,594,713) shows two substrates with two electrodes, the two electrodes being driven by a voltage source, wherein one of the electrodes is segmented.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Adam R. Giesy whose telephone number is (571) 272-7555. The examiner can normally be reached on 8:00am- 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Hudspeth can be reached on (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ARG 2/22/2005

W. R. YOUNG
PRIMARY EXAMINER